

TONNEAU COVER APPARATUS

RELATED APPLICATION

This application claims the benefit of U.S. Provisional Application Serial No. 60/423,146 filed November 1, 2002.

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FIELD OF THE INVENTION

The present invention relates generally to a support frame for truck bed covers and more particularly to a support frame for a bed cover formed of hard, soft or semi-rigid material.

BACKGROUND OF THE INVENTION

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Tonneau covers are popular among truck owners not only because of their ability to enhance the appearance of the truck but also to provide a level of protection for items contained in the truck bed that may be noticed by would-be thieves, or simply to provide protection from environmental exposure.

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Tonneau covers typically fall into one of two types, hard covers or soft covers. Hard covers are typically formed of a molded synthetic material such as fiberglass or vinyl that are hingedly mounted to the vehicle so as to be lifted up in one or more directions to provide access to the cargo bed. Gas cylinders are attached between a cover support frame and the cover to assist the user in

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lifting and holding the cover.

Soft tonneau covers are also known which utilize a frame structure for supporting a canvas or soft vinyl material that is disposed over the frame attached to the walls of the truck bed.

5 In many cases, installation of either of these types of covers becomes tedious and time consuming and in other cases requires that through-holes be made in the truck bed walls in order to facilitate the mounting of the frame structure thereto.

10 The present invention provides a truck bed cover and frame assembly that enables fast and efficient mounting of hard and soft tonneau covers without the need of having through-holes disposed in the truck bed walls for mounting thereto.

SUMMARY OF THE INVENTION

15 The present invention provides an inventive support frame for tonneau covers that can be used for covers formed of either hard, soft or semi-rigid materials.

The frame and cover assembly of the present invention has utility for a truck having a truck bed that includes a front wall, left and rear sidewalls and a tailgate such as a pickup truck.

20 The cover assembly comprises a support frame having left and right frame bars with opposing ends. The left frame bar is adapted to be disposed on a top end of the left wall and the right frame bar is likewise adapted to be disposed on the top end of the right wall.

Front and rear frame bars having opposing ends are also provided wherein the front frame bar is adapted to be disposed on the top end of the front wall while the rear frame bar is likewise adapted to be disposed on the top end of the tailgate.

5 Four corner brackets are provided and adapted for complementary engagement with the frame bars into channels formed at the ends of adjacent frame bars. The corner brackets permit the frame bars to be connected for forming the support frame for the cover assembly. It is appreciated that the area of the support frame is substantially equivalent to the area defined by the
10 four walls of the truck bed. As such, the size and shape of the support frame imitates the top end of the four walls of the truck bed.

Finally, a cover material is provided that is operative to be selectably attached to the support frame such that the truck bed is completely covered and protected against exposure.

15 **BRIEF DESCRIPTION OF THE DRAWINGS**

A better understanding of the present invention will be had upon reference to the following detailed description when read in conjunction with the accompanying drawings in which like parts are given like reference numerals and wherein:

20 Figure 1 is a perspective view of the frame and cover assembly disposed on a truck bed as according to the invention;

Figure 2 is a close-up perspective view of the features of a frame bar having a soft cover material attached thereto using a J-clip strip as according to the invention;

Figure 3 is a perspective view of the frame and cover assembly disposed on a truck bed wherein the cover material is formed of a hard or semi-rigid material;

Figure 4 is a cross-sectional view of the front frame bar of Figure 3 wherein the cover material is disposed in an upper channel of the front frame bar;

Figure 5 is an overhead view of the frame and cover assembly including an optional lift piston for supporting the cover material in a raised position;

Figure 6 illustrates a cross-sectional view of the right frame bar having an accessory attachment bracket disposed in a lower channel thereof;

Figure 7 illustrates a cross-sectional view of a right frame bar having a second accessory attachment bracket disposed in the lower channel thereof;

Figure 8 illustrates an exploded and perspective view of a corner bracket for complementary engagement with the upper and lower channels at the ends of adjacent frame bars;

Figure 9 illustrates a cross-sectional view of a right frame bar adapted to receive a cover support and accessory attachment bracket as according to the invention; and

Figure 10 illustrates a cross-sectional view of a front frame bar pivotally attached to a hinge clamp that mounts to the top end of the front wall as according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

5 With reference to Figure 1, a frame and cover assembly 10 as according to the present invention includes a front frame bar 12 disposed on a top end of the front wall of a truck bed, a rear frame bar 14 disposed on the top end of the tailgate of the truck bed, a left frame bar 16 disposed on the top end of the left sidewall, and a right frame bar 18 disposed on the top end of the right sidewall.
10 Each frame bar is an extrusion of a moldable and durable material illustratively including plastics and metals. It is appreciated that the frame and cover assembly 10 may be adapted for use in other applications illustratively including outdoor canopy and marine applications.

 If a soft cover material is used to form the cover for the assembly 10,
15 cover support bars 50 are provided with the frame assembly 10 for supporting the cover material against sagging. Each cover support 50 is preferably formed with spring biased projections extending from its opposing ends wherein the projections are adapted to engage a complementary recess or channel formed in the left and right side bars which will be described in detail hereinafter.

20 As illustrated, the cover supports 50 extend between the sidewalls of the truck bed and are typically formed such that they are arched upwardly above the plane of the top ends of the truck bed walls whereby the cover material is stretch-fitted over the frame to provide a snug and sleek appearance.

Referring now to Figure 2, a cross-sectional view of the rear frame bar 14 is provided having a soft cover material attached thereto.

The frame bars are preferably extrusions each having a triangular cross section with identical features including a vertical inner side 20, a base 23 and
5 an inclined outer side 25 extending between the base 23 and the inner side 20.

The vertical inner side 20 of the extrusion 14 includes elongated upper 22 and lower 24 channels spaced apart and separated by an elongated middle channel 27 which all extend the length of the bar. A top end 26 of the vertical inner side 20 of the extrusion is substantially flat and is parallel with the base
10 23.

At the inclined outer side 25, an elongated concave recess 28 is formed and extends along the length of the extrusion. Adjacent the base 23 at the outer side 25 is formed an elongated retaining slot for receiving a fastener attached to the cover material to be described hereinafter.

Referring now to Figure 8, a corner bracket assembly 30 is provided for
15 connecting adjacent ends of frame bars disposed on the top ends of the walls of the truck bed. Each corner bracket 30 has end walls 32 and 34 formed to mirror the triangular shape of the adjacent frame bars to be attached. An outer surface 36 of the corner bracket 30 conforms to the contour of the inclined
20 outer side of the frame bars.

The end walls 32 and 34 of the corner bracket 30 include arms 38 extending therefrom. The arms 38 are adapted to be received in the upper

channels 22 of the adjacent frame bars in slip fit engagement such that the frame bars are brought together to form the support frame 11.

Preferably, each corner bracket includes an L-bar 40 that is adapted to be selectably fastened into the lower channels 24 of the adjacent frame bars such that the frame bars are rigidly bound together. The L-bars have fastening apertures 42 formed at opposing ends for receiving a complementary fastener therein. The fasteners and L-bracket cooperate to rigidly bind the corner brackets and frame bars together.

Preferably, each corner bracket 30 cooperates with the adjacent frame bars such that the size of the support frame 11 is adjustable through the adjustment of the arms 38 within the upper channels 22 until the desired size of the frame 11 is obtained. Thereafter, the L-bars are fitted within the lower channels 24 of the adjacent frame bars and fastened thereto to rigidly bind the corner brackets and frame bars at the desired position. This may be particularly advantageous when using a soft cover, since covers have a tendency to stretch. Thus, the frame can be enlarged to take up any slack in the cover.

Referring again to Figure 2, a soft cover material is illustrated being attached to the frame bar 14. The cover material 51 includes a perimetric edge 53 that is to be attached to the outer side 25 of the frame bar 14. The cover 51 includes a J-clip 60 attached thereto via a zipper 55.

One side 54 of the zipper is stitched to an inner surface of the cover material 51 along three sides of the cover material. The zipper is positioned so

that the teeth of the zipper will be centered in the elongated concave recess 28 formed in the outer side 25. The other side 57 of the zipper is attached to the J-clip 60. The J-clip 60 includes a barb portion 61 dimensioned to be snap fitted into the elongated slot 29 formed in the outer side 25 of the frame bar. The
5 other side 57 of the zipper 55 is attached to a portion of the J-clip away from the barb 61. Along the front edge of the cover material 51 a J-clip is sewn directly to the inside surface adjacent the perimetric edge of the cover material 51 such that the cover material may be mounted onto the front frame bar 12 accordingly.

10 A strip of Velcro 52 is preferably disposed on a portion of the J-clip in a manner that is parallel and adjacent to the other side 57 of the zipper. In such case, the cover material 51 will include a complementary Velcro strip 56 for attaching the perimetric edge 53 to the Velcro strip 52 disposed on the J-clip 60.

15 Illustratively, a soft cover material is mounted to the support frame 11 by snapping the barb 61 of the J-clips 60 into the elongated slots 29 of the frame bars and zipping the zippers disposed at the three sides of the cover material 51 so that the cover material 51 is pulled tightly over the support frame 11. The outer perimetric edge 53 of the cover material 51 is neatly and
20 securely held in position by the Velcro strips 52 and 56 to provide a smooth and snug fitting appearance over the support frame 11.

When the zipper pullers from different sides of the cover material 51 meet at a corner, a lock can be used to connect the zipper handles together. If

two zipper handles do not meet at a corner, fastening loops may be provided on the cover material 51 to enable a lock to be put through the fastening loop and a through hole formed in the zipper handle.

5 Figures 3 and 4 illustrate how the support frame 11 may be used to support a semi-rigid or hard cover material in the upper channel 22 of the frame bars. As shown in figure 3, a semi-rigid cover 150 material is provided wherein an upper portion of the cover is formed by laying a piece of canvas over a mold having a shape corresponding to the desired shape of the cover. The canvas is then sprayed with a reinforcing hydrophobic polymer
10 illustratively comprised of polyurea, elastomers, and polyacrylates which facilitate the formation of a semi-rigid surface. The surface may be texturized to have the feel and appearance of Naugahyde, however, the coating provides a semi-rigid cover more rigid than typical Naugahyde. The semi-rigid cover is formed is adapted to be attachable to the frame bars in a manner similar to the
15 soft cover as described above.

As shown in Figure 4, a hinged clamp 100 is provided for attaching the front frame bar to the front wall of the truck bed. Referring to Figure 10, the hinged clamp 100 includes a hinge strip 110 to be received in a hinge slot 112 formed along an edge of the base 23 of the front frame bar 12.

20 As shown, the front frame bar 12 of the support frame 11 may be positioned on the front wall by bolting the hinge clamp 100 to the top end of the front wall and permitting the outer edge of the hinge strip 110 to slide into the hinge slot 112 of the frame bar 12. Once seated, the support frame 11 may

be pivoted outwardly from a 46° angle to lock the hinge strip 110 within the hinge slot 112 of the frame bar 14. In this manner, as long as the support frame 11 does not pivot above 23°, it remains fully engaged to the front wall of the truck bed.

5 Figure 5 illustrates an optional lift piston 116 which may be provided to facilitate lifting and holding the support frame 11 in a raised position when pivoted about the front wall of the truck bed.

 Figures 6 and 7 illustrate accessory attachment brackets 70 that may be mounted to bolts mounted to the lower channels 24 of the left and right frame bars. The heads of the bolts are held by flanges so that the threaded shaft of the
10 bolt extends from the channels 24. The accessory attachment brackets 70 have a vertical portion 90 with a hole for mounting on the shaft 82 of the bolt and a horizontal portion having a slot 92 to receive a flange extending from the frame bar. Alternatively, a nut 84 can be inserted in the channel 24 and a threaded
15 fastener may be inserted into the nut 82 for securing the attachment bracket.

 As further illustrated in Figures 6 and 7, hinged clamps 100 may be mounted to the walls of the truck bed on foam strips for providing a more stable attachment and prevent marring of the bed finish.

 As mentioned above, the extrusions of the support frame 11 may be
20 formed of any extrudable material of sufficient strength and durability suitable for such purpose. If the cover material provided is soft, the cover material may be selected from the group consisting of vinyl, canvas, plastic and/or synthetic manmade materials. If the cover material is desired to be hard, the cover

material is preferably selected from the group consisting of fiberglass, metal, wood, vinyl and hard plastics.

From the foregoing, an inventive frame and cover assembly is provided for attaching to and protecting a truck bed without the need for making through
5 holes in the truck bed for mounting the assembly thereto. Having described the invention in detail, it is appreciated that it may become apparent to one skilled in the art that other embodiments of the present invention may be resorted to, however, without exceeding the scope of the present invention.

I claim: